the Atom

Los Alamos Scientific Laboratory

March, 1978

LOS ALAMOS SCIENTIFIC LABORATORY

*the*Atom

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CONTENTS

REGULAR FEATURES

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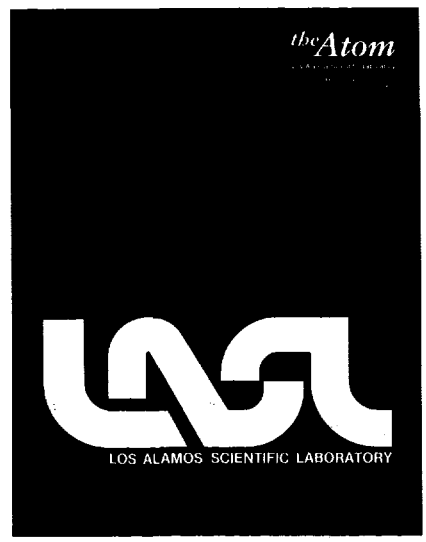


The Laboratory has a new logo. For more information turn to page 8.

Radioactive Waste, Soil Interactions Study Proves Challenging

By Barb Mulkin

If you're inclined to think in generalities you may conclude that dirt's dirt, but you're dead wrong as far as Eric Fowler and other H-8 soil scientists are concerned.

Dirt -- tons of it -- is the crux of a program coordinated by Fowler for the Nuclear Regulatory Commission's Research Branch, and just looking at the variegated samples used in the project confirms that dirt (or soil) is highly individualistic. That individualism is one of the reasons NRC funded the program, according to Fowler.

"We have been charged with providing a data base of radioactive waste and soil interactions and a means of estimating the degree of retention and the migration potential of radioactive waste in different types of soil," Fowler explains.

In addition to coordinating the LASL project, Fowler coordinates 2 other segments of the program. They involve studies conducted by the University of California at Los Angeles and at Berkeley on plant uptake of radionuclides from radioactive waste, and study of plant

A miniature mountain of soil samples, screened and processed, spreads out in the H-8 greenhouse. The dirt, tons of it, is part of a LASL program providing data on radioactive waste and soil interactions.

uptake of radionuclides from nuclear power plant stack effluent that is managed by the University of Georgia's Savannah River Ecology Laboratory in conjunction with the Department of Energy's Savannah River Operations Office.

Will Polzer and Ed Essington, who are involved in the day-to-day operation of the H-8 program, believe the interaction of radioactive waste and different types of soil must be known so that good judgement can be made in siting radioactive treatment and storage facilities, in planning waste management operations, and in any necessary cleanup operations involving soil.

Since soils over the United States vary considerably in their chemical and physical characteristics, and so does waste, depending on where it was generated, the urgency of compiling a data base is self-evident, and the task is challenging.

The most direct method of compiling such information would be to apply a typical radioactive effluent to soil in the field and follow the progress of radionuclides as they migrate through the earth under natural conditions.

However, as Essington points out, this approach is "impractical . . . because of the pressures against disturbing radioactive material in the environment, even for controlled experiments, and because extremely long times would be needed to follow the progress of long-lived radionuclides in order to observe the slow, but important, changes in soil-waste interactions."

In the past, laboratory studies using simple systems of single radionuclides of interest have been extrapolated in an effort to predict the migration of complex radioactive waste in soil. Extrapolation of such single isotope studies has often led to confusion. The need for reliable data relative to waste management led to the NRC-funded program.

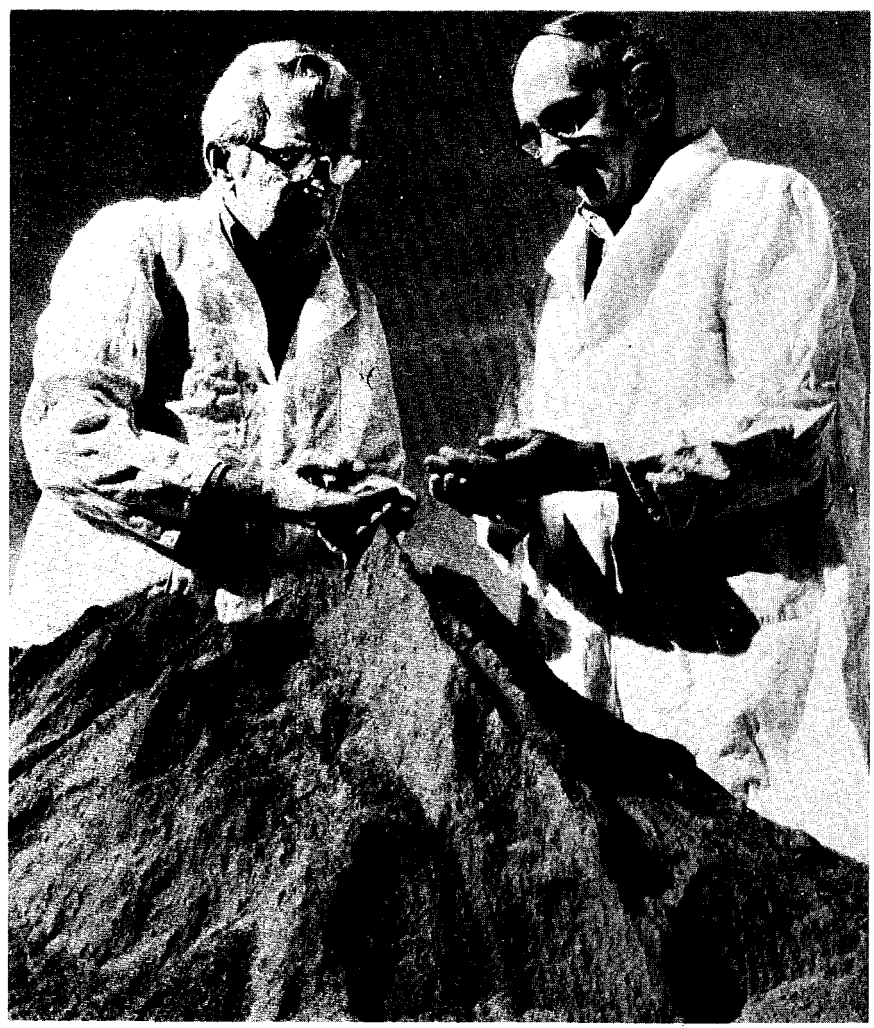
The LASL project is the first to use a wide variety of soils and actual samples of radioactive wastes to provide a reliable model of how such wastes change in storage, and the influence of soil in the concentration of soluble radionuclides.

Working with state and regional Soil Conservation Service personnel, H-8 purchased tons of soil from landowners and obtained soil samples from Bureau of Land Management acreage, in South Carolina, Illinois, New York, Washington, Kentucky, Nevada, California, and New Mexico. The geographic cross section provides material from the major soil groups.

What Polzer refers to as "horizons" — successive, overlying layers of soil to a depth of 4 feet — are carefully loaded into 55-gallon drums, labeled by region and by horizon, and shipped to LASL.

The soil is dried outdoors in summer, in H-8's greenhouse at TA-50 in winter, and is pulverized and sifted through quarter-inch mesh by Barry Drennon. As much as 1800 pounds of 6-8 ton regional sample is shipped by Drennon to

Eric Fowler, left, and Will Polzer examine the texture of a mound of "A" horizon soil that has been dried and screened. The "A" horizon is a layer of soil found near the surface.



Soils from the field are brought to H-8 and dumped into big piles by horizons. A pile containing a horizon is quartered. The 4 smaller piles then are shoveled back into one big pile and re-mixed. This re-mixing is necessary to ensure that the soil from any one horizon is thoroughly mixed before being processed further.

Dirt's Not Just Dirt

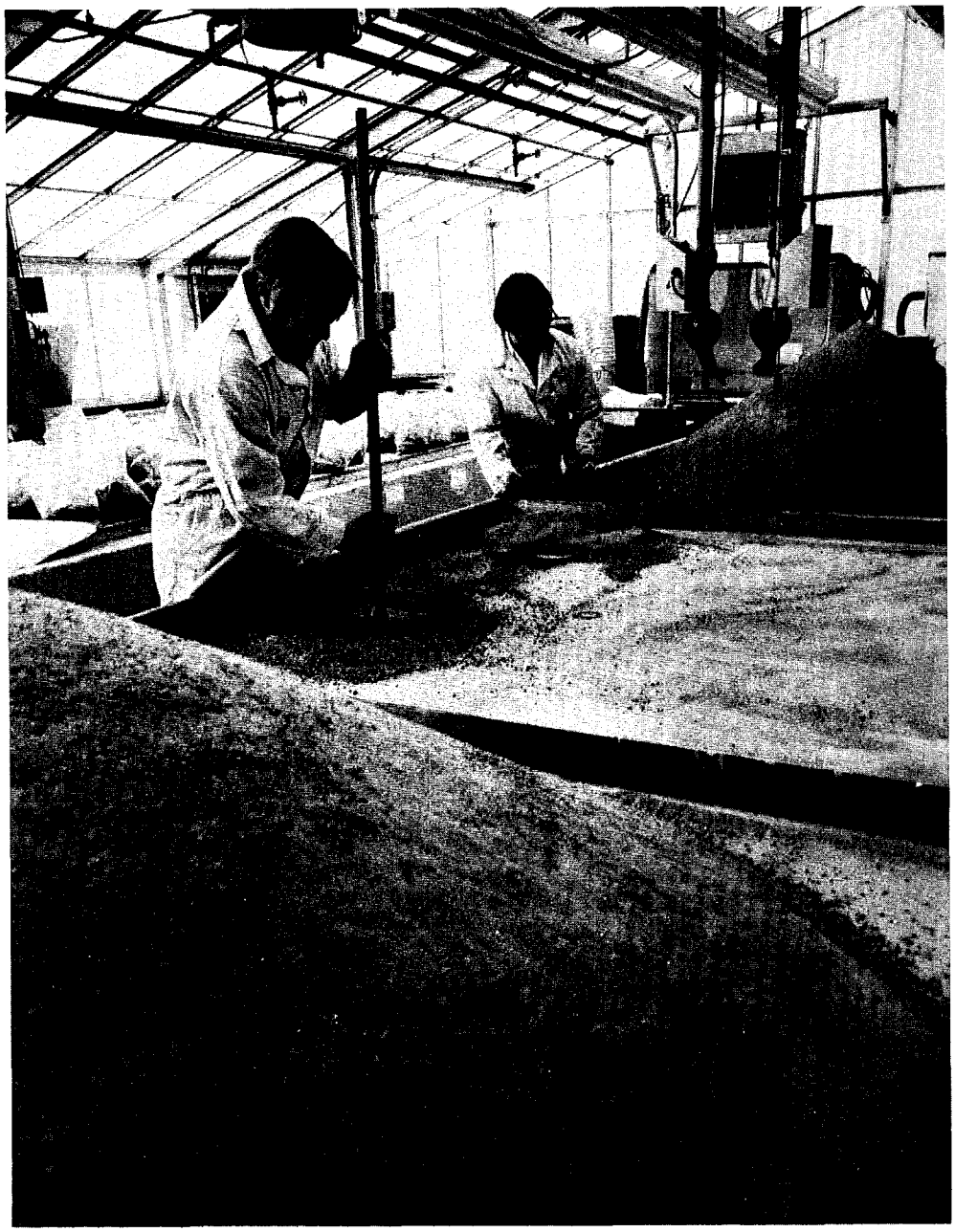
Soils are packaged in the field and shipped in large barrels. Drennon and Burton inspect the condition of soil collected in New York.

UCLA and to Berkeley. The remainder is prepared for LASL testing by Barry Burton.

Polzer claims that as many as 500 individual analyses (including replication) may be necessary for a single waste-soil combination.

Polzer and Burton select and analyze random waste samples from the Laboratory's liquid waste treatment plant and characterize soil samples from specific regions and horizons.

Polzer and Burton are using a batch technique for the basic interaction tests. Soil and waste samples (at a constant ratio of 1 to 4 for soil to waste) are mixed. The samples are allowed to stand for 5 days, with periodic shaking. The mixes are then centrifuged to re-



Soils taken in the field throughout the United States are brought to the greenhouse, crushed, screened, separated and bagged.

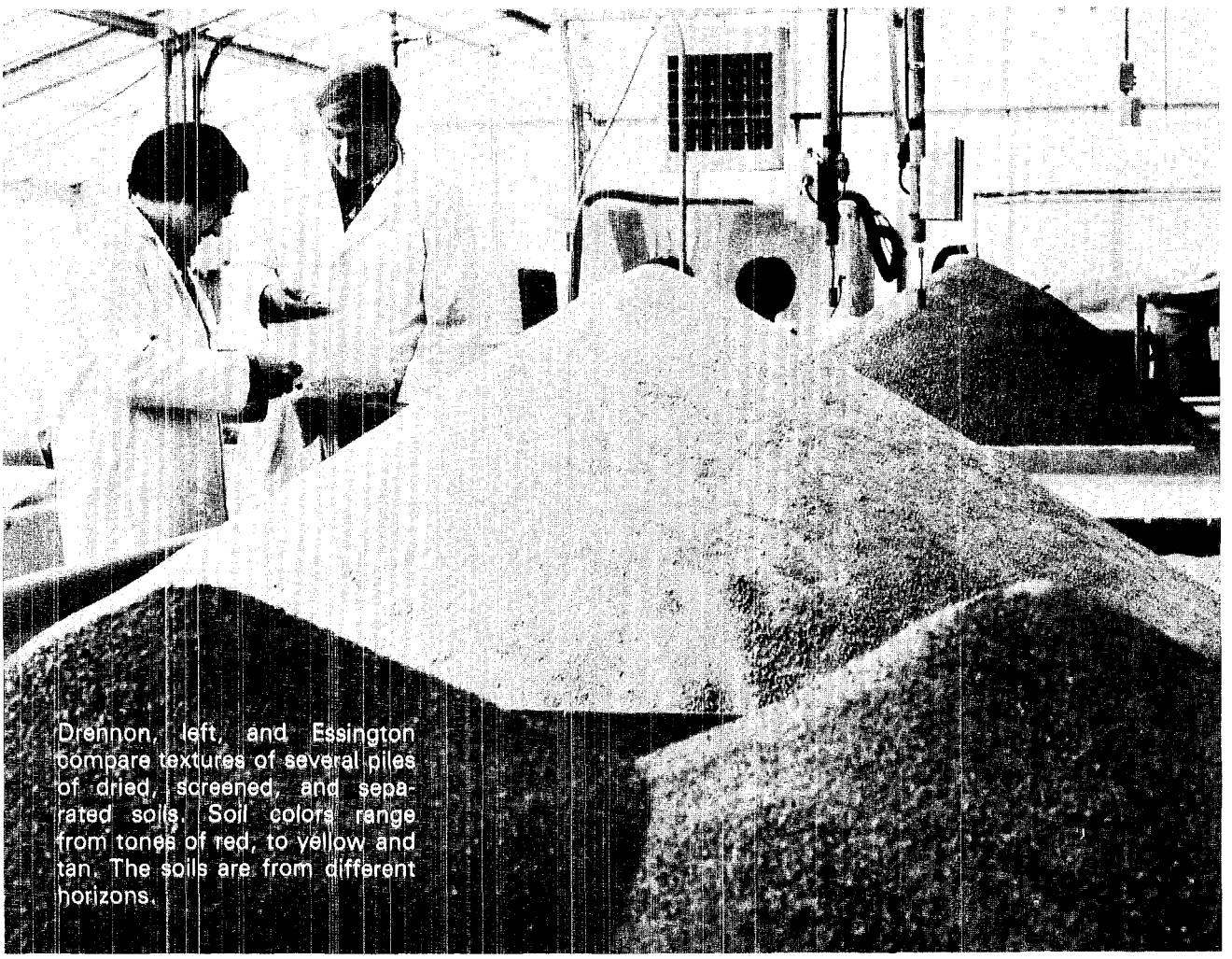
move particles from the supernate (solution) that are larger than 0.024 microns. Polzer and Burton then analyze the supernate for selected radioisotopes, such as plutonium-238 and 239-240, uranium-235-236, 238, and 233-234, and americium-241.

Analyses are conducted on aliquots of the same sample for major chemical and physical characteristics which may affect the retention of radionuclides. Other tests are conducted on untreated and on treated waste that is stored for long periods. All of the tests are designed to determine how many of the radionuclides present in the waste stay in solution. Material that remains with the solution may migrate, possibly to underground water tables, and then to the environment.

Understanding of Waste-Soil Interactions Vital

Fowler reports that the studies developed in H-8 are yielding impressive results on the ability of different soils to trap radioactive particles, on the type of radionuclides which remain with the solution, and on the adsorption and absorption capabilities of specific soils for specific radionuclides.

"We need a thorough understanding of surface and near-surface waste-soil interactions so that



Drennon, left, and Essington compare textures of several piles of dried, screened, and separated soils. Soil colors range from tones of red, to yellow and tan. The soils are from different horizons.

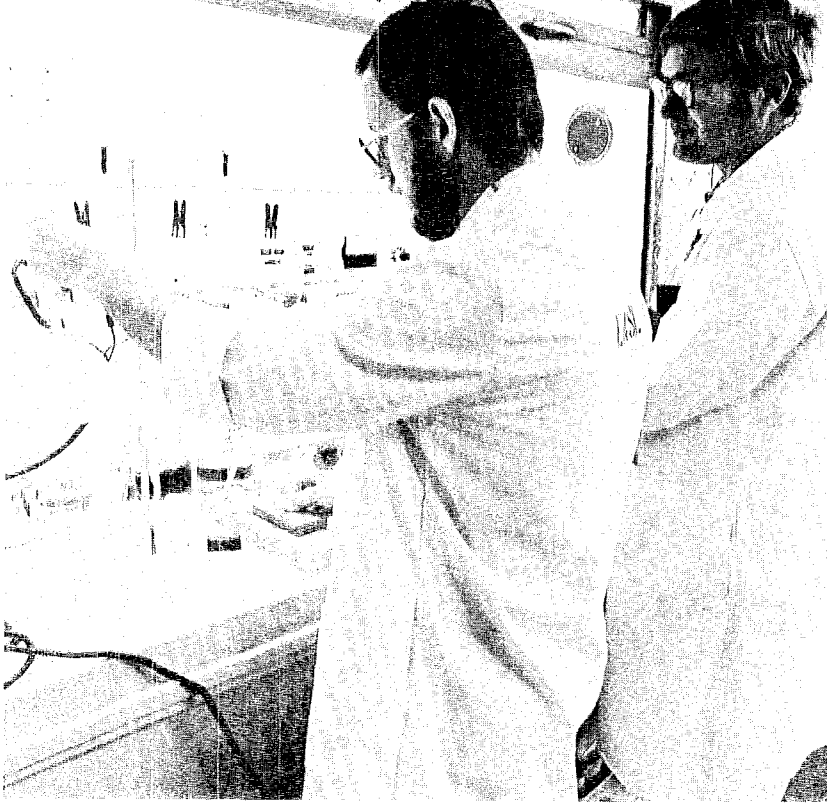
we can predict the possible impact of accidental release of radioactive materials and the effect of waste seepage through the soil," Fowler sums up. "Different horizons in the upper 4 feet of soil are investigated because they will act differently as receptors for effluents from treatment plants, from wastes accidentally dispersed, or from some fraction of wastes leaving burial grounds by natural leaching."

To gain that understanding, H-8 starts with dirt — tons of it — sulfurish yellow-gray clay from New York, dark, moist loam from Illinois, and the striking, ochre-rich red soil from South Carolina that once

Polzer fastens bags of subsamples of soil from various horizons in a 4-foot-deep cut, the normal depth of sampling for this project. The subsamples are taken every 5 centimeters (approximately 2 inches) to gain a very accurate picture of the soil.

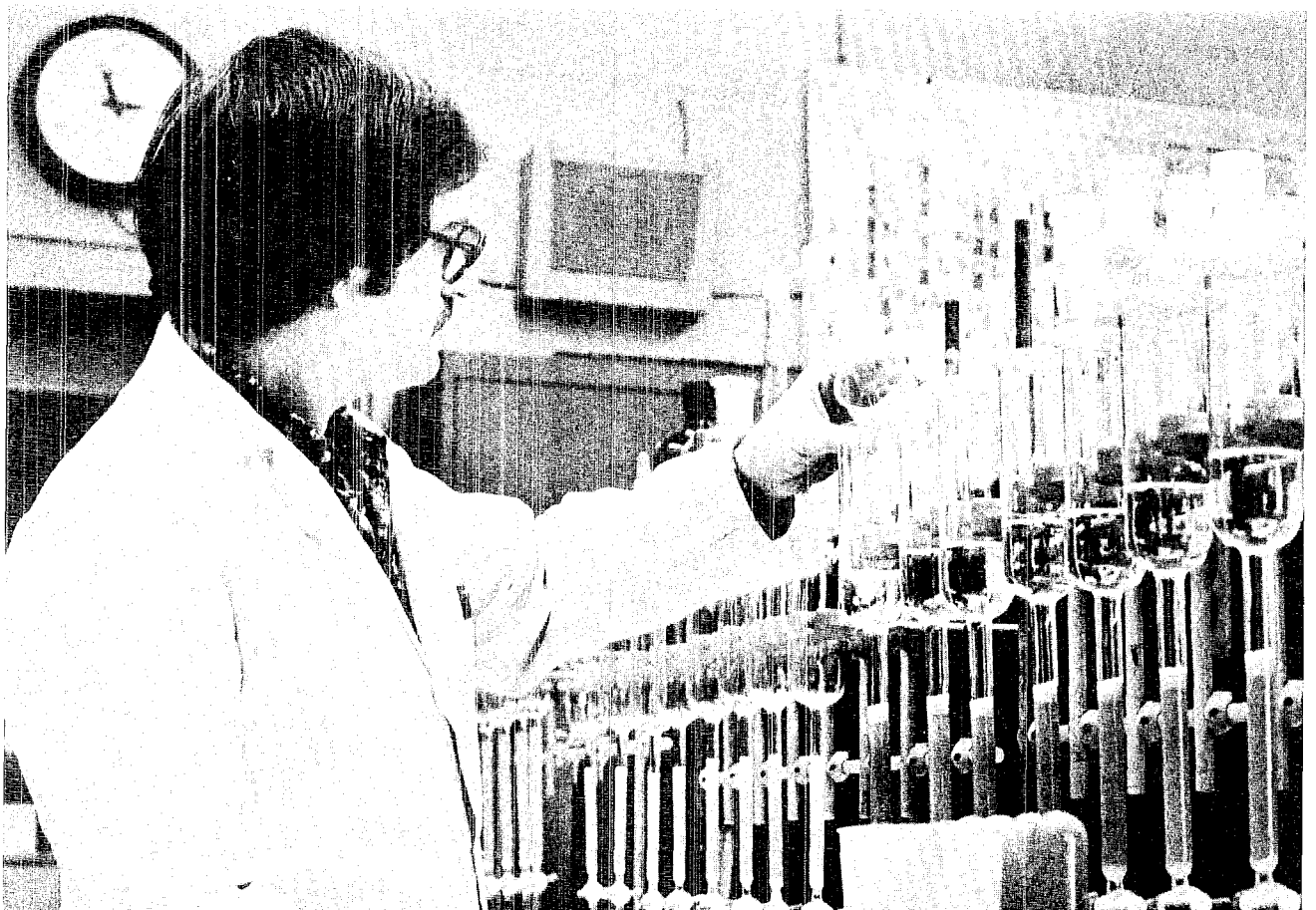
yielded war paint to Indian warriors.

H-8 has a new answer to the mournful question posed by Tennessee Ernie Ford: You load 16 tons and what do you get? The answer is: knowledge.



Barry Burton, left, and Edward Essington study ammonia derived from a sample of processed waste material. Ammonia is studied to determine its effect on the transport of waste material through the soil.

Barry Drennon experiments with an ion exchange process to separate various radionuclides from soil samples.



LASL Has A New Logo

Los Alamos Scientific Laboratory has a new logo.

Creation of the new logo is part of a public relations effort at the Laboratory to form a "new image" in graphics and design.

Several months ago a contest was conducted in which interested persons in the Los Alamos area were encouraged to submit designs for a new logo for the Laboratory. A design concept submitted by Richard C. Walther, WPC-1, was the winner.

Walther's proposed logo consisted simply of the gracefully-styled letters LASL (see photo on the opposite page). A graphics committee of people from ENG-11, ISD-3, PUB-1, and Ted Rose, graphics consultant to the Engineering Department, considered the design submitted by Walther to have much potential.

After many meetings and several modifications of lettering, a logo, born from Walther's idea, was agreed upon by committee members. The design then was presented to LASL Director Harold Agnew for his approval.

When the logo became official, a ceremony was held in which Agnew congratulated Walther for his winning design. The Director stated: "I wish to congratulate you on your design concept for a new logo for the Los Alamos Scientific Laboratory. I believe your ideal fully symbolizes LASL as a modern, forward-looking Laboratory dedicated to the needs of the nation. I am sure it will increase the identity and visibility of the Laboratory and greatly assist our efforts in informing the public of our scientific achievements."

The Laboratory sincerely thanks all persons who submitted logo design concepts for consideration. Many good designs were received, and the employee interest in the Laboratory's efforts to create a new graphic image is appreciated.

LASL Director Harold Agnew inspects logo designs for the Laboratory, as Richard C. Walther, WPC-1, center, and David Moore, Public Relations Department head, right, look on. Walther submitted the basic design concept, held in Agnew's right hand, which was modified to create the new LASL logo, samples of which are in Agnew's left hand. Walther's design was chosen from more than 100 entries in a contest conducted several months ago. The new logo is part of an effort to change the Laboratory's graphics image.

LASL - Pioneer Of Nuclear Safeguards Research

Acronyms are often like umbrellas — small canopies covering large, and sometimes complex subjects. So it is with "SNM", short for "Special Nuclear Materials" — the key ingredient of nuclear power, and at the same time the stuff of controversy in the nuclear age.

Strategic quantities of SNM is defined by the U.S. government as "amounts greater than 2 kilograms of plutonium and 5 kilograms of uranium enriched to more than 20 percent." Before passage of the Atomic Energy Act of 1954, all of the strategic nuclear materials and facilities in this country were owned and controlled by the government. The 1954 Act permitted commercial organizations to own SNM for peaceful uses of nuclear energy, and all over the world, a vigorous courtship of the powerful atom began.

"In 1954 it was comparatively easy to control nuclear materials," G. Robert Keepin, Associate Q-Division Leader for Nuclear Safeguards and director of LASL's Nuclear Safeguards Program, comments, "because relatively small amounts were in use, and the high monetary value of the materials as well as the severe criminal penalties for their unauthorized use, provided sufficient incentives for strict accountability and control."

By the mid-60's, Keepin says, expansion of the nuclear industry made it apparent that a large number of commercial organizations would be handling SNM, and an expanded program was initiated by the Atomic Energy Commission for safeguarding both nuclear materials and facilities.

Two federal agencies have safeguards responsibilities: the Department of Energy (DOE), which oversees safeguards in government-owned facilities and conducts research and development on domestic and international safeguards technology and applications; and the Nuclear Regulatory Commission (NRC), charged with establishing safeguards regulations for domestic commercial activities and ensuring compliance with these requirements.

Both agencies work closely with LASL, the laboratory that pioneered modern safeguards research as early as 1966, when a small R&D group, headed by Keepin, was formed within LASL's N-Division. Los Alamos safeguards R&D has spearheaded the development of a wide range of new techniques and methods for implementing effective safeguards on both the international, and domestic levels.

To transfer newly developed safeguards technology to the nuclear industry, Los Alamos conducts the world's foremost "School for Safeguards." Since its initiation in 1973, the DOE-sponsored safeguards training program at LASL has trained some 400 safeguards inspectors and instrument users from DOE, NRC, and more than 30 foreign countries, in the use of nondestructive assay (NDA) techniques and equipment developed at Los Alamos.

Nondestructive assay permits accurate, rapid measurement of nuclear materials without destroying the sample or item being measured. Such NDA techniques are the cornerstone of LASL's DYMAC

(Dynamic Materials Control) system, an SNM measurement and control concept that is currently being implemented in the Laboratory's new plutonium process facility for continuous assay and accountability of materials moving through the plant.

That both industry and government are aware of the need for an aggressive nuclear materials control program is evident from the history of international nuclear safeguards development.

In 1957, the Vienna, Austria-based International Atomic Energy Agency was formed under the auspices of the United Nations. Its charter: To foster peaceful uses of nuclear energy.

In 1961, the IAEA established an overall system for applying nuclear materials safeguards. In 1964, the 88th U.S. Congress passed the Private Ownership of Special Nuclear Materials Act (which went into effect in 1970).

A treaty on Non Proliferation of Nuclear Weapons was drawn up at the Geneva Disarmament Conference and endorsed, in 1968, by the United Nations. Placed in force in 1970, the Nonproliferation Treaty has now been signed by some 112 countries.

Signatories to this treaty are prohibited from transferring nuclear weapons to any country that does not have a nuclear weapons capability. Such countries are prohibited from manufacturing nuclear weapons or acquiring them, and they are obligated to adopt IAEA safeguards and to accept IAEA inspection of their nuclear facilities to ensure that there is no diversion of nuclear materials to military applications.

For countries without nuclear technology, procedures have been devised for such countries to participate in the development and utilization of the peaceful atom and still assure that the required nuclear materials are properly safeguarded against diversion.

The United States has played a leading role in developing the technology required for effective international safeguards, and LASL's Bob Keepin believes U.S. tech-

Paul Elkins, left, and Robert Ford, both E-5, are among many persons involved in setting up the central computer facility for the plutonium handling plant. The computers will allow an operator to know instantly the location and status of nuclear materials being used in the plant.

nology has, by and large, kept pace with the increasingly strict safeguards requirements being placed on this country's domestic nuclear fuel cycle.

However, he notes that "Safeguards plays an even more important role in the international arena, where the threat of nuclear material diversion and malevolent use can come not only from subnational groups, but from a concealed effort by an entire nation."

As amounts of nuclear materials and the number of nuclear facilities increase with the worldwide growth of nuclear power, safeguards will be continuously improved and expanded.

"Whatever overall safeguards and security measures are taken, stringent in-plant materials control seems destined to play a major role in safeguarding SNM in sensitive fuel-cycle facilities — both national and international," Keepin emphasizes.

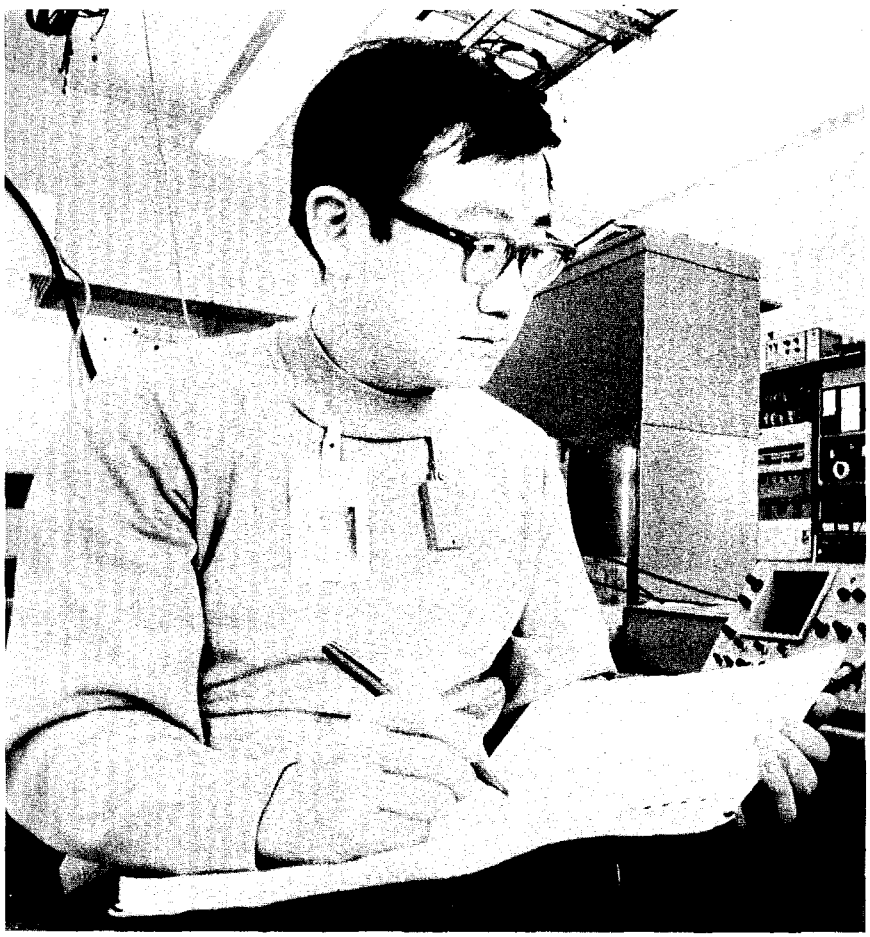
To meet the demanding safeguards needs of the future, more than 100 LASL employees are now engaged in nuclear safeguards R&D at Los Alamos.

Scientist Exemplifies Japanese Commitment

Japan has a strong, rapidly expanding nuclear industry, a firm commitment to peaceful use of the atom, and an extraordinary dedication to improving its technological nuclear research base.

That dedication is exemplified by a visiting LASL staff member, Keisuke Kaieda, who came to Los Alamos in October, 1977, for 12 months of study with the Laboratory's Nuclear Safeguards Program. Kaieda, a nuclear engineer with the Japan Atomic Energy Research Institute (JAERI), was forced to leave his family in Japan. His daughter, Emi, 9, has a heart ailment, and her physician would not allow her to come to Los Alamos because our high altitude could be harmful to her.

Kaieda will visit Emi, his wife Akemi, and his 7-year-old son, Yoshinori in August in Los Angeles. The reunion will be the family's only opportunity to be together until Kaieda returns to Japan next October.



Keisuke Kaieda, a nuclear engineer with the Japan Atomic Energy Research Institute, is at LASL for a year "to learn how and to what extent the Non-Proliferation Treaty can be implemented without interference with the peaceful use of atomic energy."

Technical Assistance To IAEA Stressed

JAERI is roughly the equivalent of LASL in relation to the government -- LASL is operated by the University of California under contract to the Department of Energy, and JAERI is a research and development organization funded by the Science and Technology Agency of the Japenese government.

Kaieda is in Los Alamos because, he says, "We are trying to learn how and to what extent the Non-Proliferation Treaty can be implemented without interference with the peaceful use of atomic energy."

The visiting staff member believes that modern safeguards technology might be compared with computer technology: "There are 2 basic elements, 'software,' and 'hardware,' " he says. "Software is the NPI, a program of fundamental importance. Hardware is the broad spectrum of non-destructive assay (NDA) techniques that are necessary to make the Treaty work. Used together, these elements can solve the problem of safeguarding nuclear materials."

Kaieda believes that the United States leads the world in development of advanced NDA techniques for safeguarding and controlling nuclear material, and he is in Los Alamos to study the DYMAC (Dynamic Material Control) system and LASL's basic safeguards concepts.

"I believe we can exchange ideas and this will prove of mutual benefit," he says. Kaieda describes the Japanese government's budget for safeguards R&D as "Small -- perhaps $4 million, compared with as much as $150 million in America."

Nevertheless, he says, Japan has a vital interest in safeguards, and has probably sent more scientists and industry representatives to Los Alamos and other U.S. research institutions than has any other nation.

"Japan Must Stay on Top"

"Japan has 8 nuclear power plants now operating and is planning to construct 5 more," Kaieda explains. "In addition, we have a nuclear fuel reprocessing plant and will have another, larger reprocessing plant in operation by 1980. We will also have a nuclear fuel fabrication plant in operation soon. With this investment, Japan must stay on top of advanced technology in all aspects of the nuclear fuel cycle, including safeguards."

Kaieda, whose specialty is non-destructive assay of spent nuclear reactor fuel, will return to Japan to take part in that country's NDA safeguards program. Specifically, he will be using NDA techniques, including LASL's concepts and technology, to determine the amount of fissile material in spent fuel using gamma spectroscopy techniques such as are taught at the LASL's safeguards school.

An impressive number of nations have signed the Non-Proliferation Treaty, which is designed to halt the spread of nuclear arms. However, the Treaty would serve little purpose if compliance with the terms of the treaty cannot be effectively implemented and independently verified by the International Atomic Energy Agency. This worldwide responsibility is an awesome mandate for the IAEA, and the Agency is indeed hard pressed to keep up with the spread of nuclear technology.

To enhance IAEA safeguards capabilities, the U.S. Congress has authorized a program of special technical assistance to the Agency. Funding for the new program is from the U.S. State Department, with Brookhaven National Laboratory playing a coordinating role and LASL providing a major source of manpower, equipment, and the wealth of the Laboratory's safeguards experience.

Charles Hatcher, Q-1 is program manager for the technical assistance plan that was implemented in April 1977. He stresses that the program is designed to complement the methods and techniques that IAEA normally uses to implement international safeguards funded from its regular budget.

In addition to money for equipment and manpower, the United States is strongly supporting IAEA on a policy level by helping extend the application of the agency's safeguards, and by fostering development and promotion of multinational, regional fuel cycle centers, including international centers for storage of spent fuel and plutonium. The U.S. has agreed to have IAEA safeguards applied to all of this country's nuclear facilities except those of direct national security significance, and, the United States is strongly committed to supporting and strengthening the

effectiveness of international safeguards.

Hatcher says three major changes will take place in the worldwide safeguards program in the next few years.

"The first change will be an enormous increase in the information that must be gathered and analyzed as more nuclear facilities come under IAEA safeguards," he explains. "The second change will be the new types and sizes of nuclear facilities in various countries that will become central to the questions of proliferation. These facilities include isotope separation plants, large spent fuel reprocessing plants, and plants for fabricated mixed uranium-plutonium oxide fuel for power reactors or highly enriched uranium fuel for research reactors."

The third major area of change will be the requirement that IAEA deal with complete nuclear fuel

Bob Marshall, Q-3, focuses attention to a thermal neutron coincidence counter on a glovebox in an area of the facility where fuel pellets are made. Any container of nuclear material that is to be transferred out of this work area must be subjected to monitoring of the neutron counter.

cycles within a single state or within close international groupings. Hatcher believes "These changes will mean IAEA safeguards must be adapted to the particular (national or international) facility in order to achieve the required level of effectiveness."

Hatcher points out that IAEA's safeguards staff is heavily burdened by present obligations, and "When the changes I have outlined occur, that load will become next to impossible."

To alleviate the problem, the new American assistance plan provides for skilled technical experts to aid the IAEA. These experts (including a LASL staffer John Foley presently on one-year assignment to the IAEA) are introducing new and improved techniques for measurement, accountability, containment and surveillance of strategic nuclear materials.

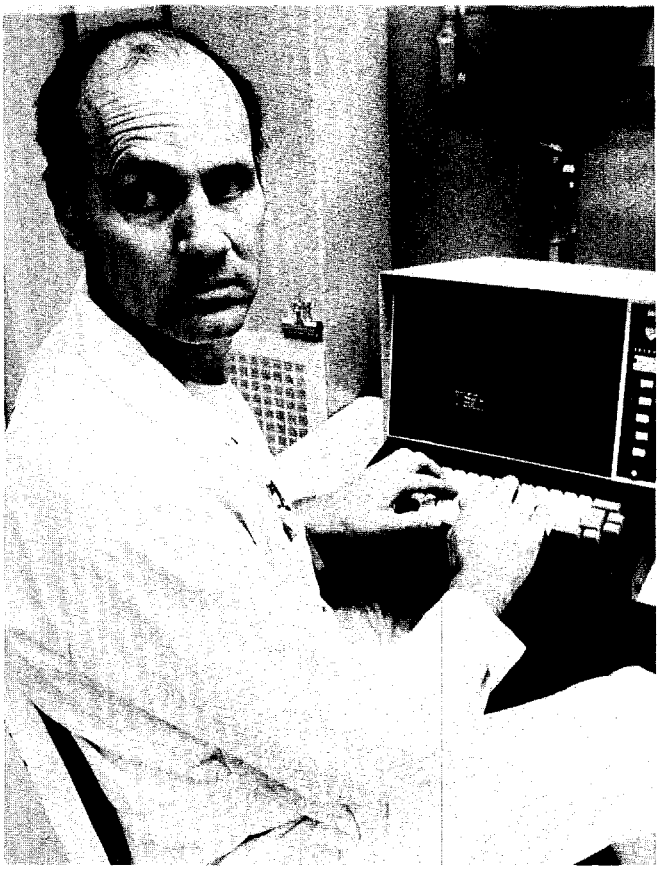
"The major goals of the new plan are to improve the agency's effectiveness and timeliness in detecting missing nuclear material," Hatcher says. "New methods of measuring will be made available to IAEA, and together with improved surveillance and containment capability, these techniques will allow substantial improvements to be made in every area of IAEA safeguards responsibility."

The dynamic growth of the nuclear industry around the world may require new agreements in the future, with consequent evolution and changes in IAEA safeguards functions, but Hatcher is confident that cooperative effort can keep pace with the expansion.

"We have the technology and the commitment," he says, "and I believe the benefits of nuclear energy are worth the effort we must expend in achieving effective international safeguards."

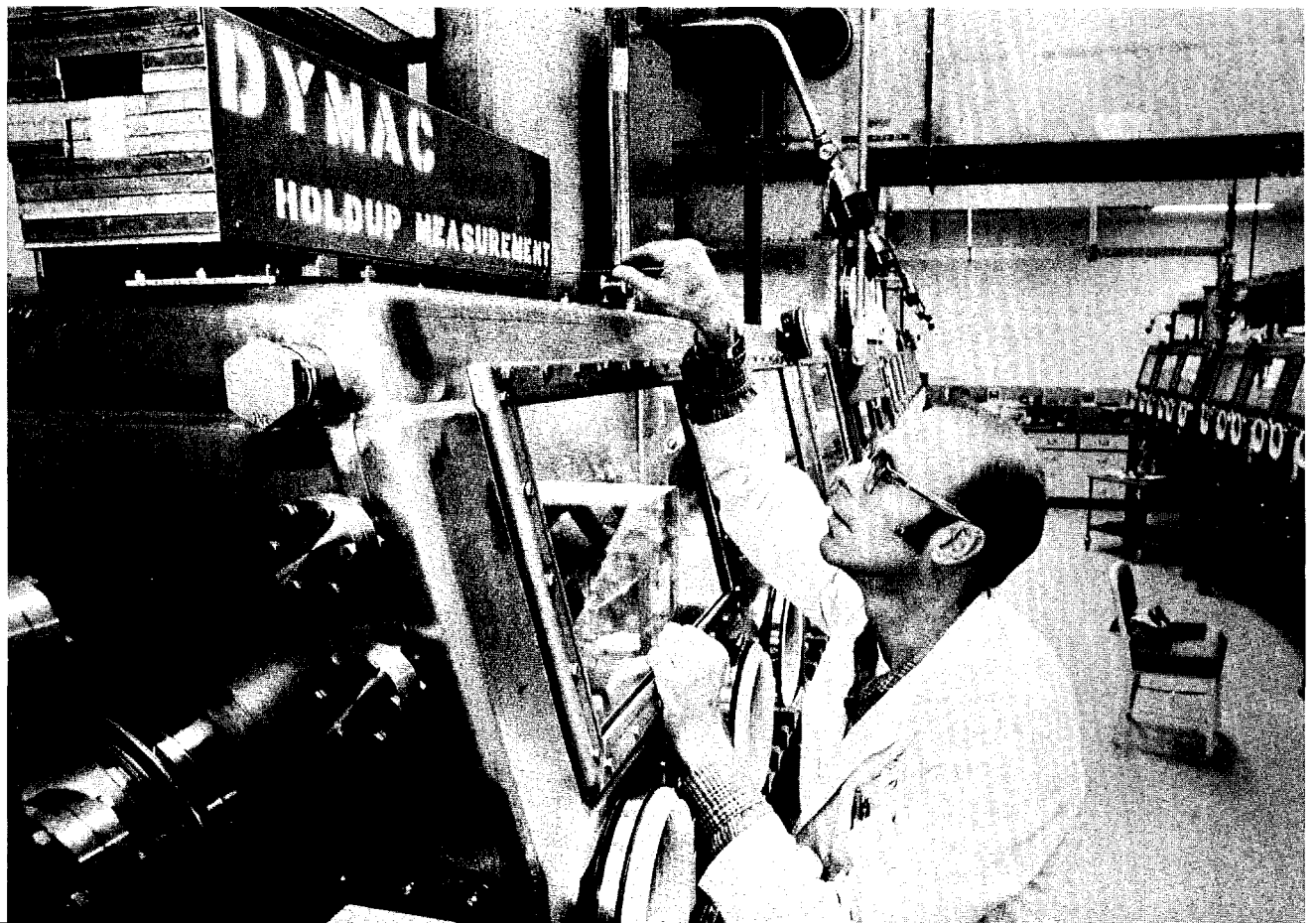
More photos on page 16.

Gene Moore, CMB-11, adjusts an electronic balance, a DYMAC instrument used to weigh nuclear material. If the material is to stay in the work area, the balance is used, since it is a very accurate method of determining the amount of material. If the material is transferred out of the immediate work area, a neutron counter must be used.



Gene Moore, CMB-11, enters information on 1 of the many terminals located in the plutonium handling areas. The computer system will permit direct transmitting and receiving of essential information without the intermediate step of paperwork, thereby helping eliminate the possibility of many errors in compiling information.

Bob Marshall, Q-3, puts the last screw into a DYMAC holdup instrument, a gamma detector, which monitors the plutonium accumulation in the exhaust unit of a glove box. The monitoring is conducted usually for a period of at least a year.



Short Subjects

The Atom is planning to devote the entire combined July-August issue to the 35th anniversary of the Los Alamos Scientific Laboratory.

Anyone who has interesting old photographs, stories, anecdotes, and useful information on the founding and development of the Laboratory during the past 35 years, and wishing to share their experiences with others, is encouraged to contact *The Atom* editor, John Armistead, at 667-6101, MS-318.

Persons who want to contribute materials to the special issue are asked to contact *The Atom* office as soon as possible. Original materials will be returned if requested.

John W. Taylor, a staff member at LASL since 1957, has been named head of the Laboratory's Theoretical Design (TD) Division effective February 1. Taylor succeeds Raymond Pollock who leaves the Laboratory to enter private industry. Other positions held at LASL by Taylor include assistant group leader of GMX-6, alternate group leader of GMX-6, M-2 group leader, and M-Division leader, a title he held until being named TD-Division head.

* * *

David R. Smith, Q-14, has received an Achievement Award from the American Nuclear Society's Nuclear Criticality Safety Division. The award, given at the Society's winter meeting in December in San Francisco, cites Smith for his activity in criticality and safety programs sponsored by the American Nuclear Society over a period of many years.

* * *

LASL Director **Harold Agnew** has been nominated by President Jimmy Carter for reappointment to the General Advisory Committee to the Arms Control and Disarmament Agency. Agnew is among 8 persons nominated by the President to be members of the committee.

* * *

RETIREMENTS: **Hugh K. Jennings**, P-9, staff member; **Roy Reider**, H-3, staff member; **Robert S. Burdette**, ENG-4, liaison engineer; **Robert L. Cole**, Q-10, cryogenics development technician; **David B. Hall**, Q-DO, staff member; **James R. Lilienthal**, CMB-DO, staff member; **Margaret L. Cole**, ENG-DO, secretary; **Alfonso R. Quintana**, property representative; **Eleanor D. Dunn**, MP-DO, section leader; **Dorothy F. Gill**, AO-6, accounting clerk; **William J. Heyman**, CMB-11, special process technician; **Arthur A. Usner**, WX-7, staff member; **Claudia V. York**, E-2, electronics technician; **Morris Battat**, T-1, staff member; **Dorothy Squires**, P-3, nuclear microscopist; **Nancelie Burdette**, E-DO, secretary; **Harry F. Schulte**, H-5, staff member.

DEATHS: **Clement F. Toft**, DIR-SEC, chief, security education; **Anne N. Phillips**, J-16, staff member.

LASL Director Harold Agnew congratulates Lenard Trimmer, M-1, upon Trimmer's membership in the Wise Owl Club of the National Society for the Prevention of Blindness, Inc. Trimmer was counterboring a piece of tubing in a lathe when the drill broke and a piece of metal struck the right lens of his safety glasses. Had he not been wearing safety glasses, concluded the Wise Owl Club, Trimmer would have been blinded in his right eye.

In Recognition

More than 600 LASL employees received their 10, 15, 20, 25, 30 or 35 year awards during ceremonies the middle of February in the Laboratory main auditorium.

Family members and friends were on hand for the presentations.

The recipients are listed in the group or division office in which they worked as of December 31, 1977.

•

10 Years

Armstrong, Harold W., WX-4
Asprey, Margaret E., Q-7
Atencio, Jerry H., AP-2
Augustson, Ronald H., Q-3
Balibrera, Mario S., ISD-9
Baran, Edward J., CTR-4
Barnes, E. June, AO-5
Barnett, Charles R., ISD-9
Bartram, Donald E., J-14
Belian, Richard D., P-4
Bennorth, Ralph W., WX-4
Berzins, George J., J-12
Black, David A., C-1
Black, Thelma B., CMB-1
Blackstone, Robert B., ENG-14
Bolstad, John W., Q-6
Booth, Memory Jo, SD-2
Bradley, William A., WX-8
Brewer, Gordon R., CMB-14
Brode, Andrew L., SD-5
Brown, David, MP-13
Buchanan, Russell B., Jr., H-1
Bunch, James M., TD-2
Button, Luella M., J-DO
Call, Darrell L., L-10
Campbell, Laurence J., Q-10
Carlson, Walter E., ENG-4
Casados, Joseph B., SD-1
Cheadle, Jesse M., III, Q-12
Clinton, David Dee, CNC-11
Connor, Gayle, C-4
Croasdell, Kent C., J-14
Cummings, Charles E., WX-4
Cunningham, J. James, H-4
Davis, Alvin H., J-9
Davis, Doyle A., ENG-12
Davis, Jerry L., MP-11
De Haven, Russell A., MP-11
Denbow, Florence M., AP-DO
De Poorter, Cheryl K., AP-4
Dings, Laura M., L-10
Douglass, Charlene, C-1
Duffield, Robert B., G-DOT
Dunning, Doris H., H-DO
Dye, Janis M., TD-7
Dyson, Jack E., SD-5
Ekdahl, Carl A., Jr., CTR-3
Ekeroth, Gustaf A., Jr., MP-1
Evans, Albert E., Jr., Q-14
Farmer, Darrel K., WX-3
Ferguson, Harold D., MP-11
Fraley, Gary S., L-6
Freer, Jerry C., WX-3
Freyman Marilyn L., P-4
Fuentes, Gilbert T., C-1
Fukushima, Eiichi, CNC-4
Gallegos, Gerald A., AP-1
Garcia, David L., E-5
Garcia, Raymond L., SD-1
Gonzales, Gilbert Joe, MP-8
Grant, Mary E., WX-3
Grieggs, Robert J., CTR-1
Griego, David S., WX-1
Griego, Joe E., AP-1
Haarman, Roy A., WX-8
Haberstich, Albert, CTR-2
Hack, Alan L., H-5
Hackman, Gerald F., L-9
Halliday, Marilynn J., CMB-11
Harbour, Nadyne, L-10
Harkelroad, Orvil D., Q-10
Hassenzahl, William V., Q-10
Havens, James H., MP-7
Henderson, Dorothy M., H-1
Hennigan, Billie F., SD-DO
Hicks, Richard D., CTR-3
Hidalgo, Edward M., J-14
Hill, Robert I., SD-5
Hindman, Miles A., J-8
Horak, Henry G., J-10
Hutson, Richard L., MP-3
Iwanchuk, Paul N., C-11
Jennings, Noel D., SP-4
Johnson, Charles P., C-1
Jones, David F., L-1
Jones, Raleigh G., SD-5
Katcher, Joe G., MP-11
King, James C., M-6
Lambert, James E., MP-7
Lee, Elise Y.L., AADP-2
Lenhart, Barry N., M-1
Leyba, Cayetano, SD-1
Lindman, Erick L., Jr., L-6
Lopez, Joseph E., Jr., C-1
Lopez, Thomas A., MP-4
Lucero, John O., H-1
Luke, Harry H., WX-1
Lundgaard, Neal A., Jr., L-10
Lundy, Arvid S., E-5
Lutes, Warren D., WX-4
McClannahan, Michael R., Q-10
McCormick, Margery J., C-2
McDow, James G., SD-5
McFarland, Robert D., Q-11
McKee, Edna E., C-1
McNally, James H., L-DO
MacFarlane, Robert E., T-2
Malanify, John J., P-11
Maraman, Katherine A., MP-8
Marquez, Alcario R., G-5
Marsh, William R., E-1
Martin, Elgin R., L-1

Martinez, Horace J., CMB-6
Matuska, Walter Jr., J-15
Meissner, John A., Q-11
Melendez, Karl J., C-3
Menlove, Howard O., WX-4
Messimer, James A., WX-4
Meyer, Earl A., P-14
Miera, LeRoy R., ENG-4
Mikkelson, Charles W., PER-1
Milder, Martin L., P-5
Miller, Raymond E., ENG-8
Mills, Ruby N., ISD-4
Mills, Thomas R., CNC-4
Mingo, Dennis K., ENG-1
Mitchell, Larry J., J-7
Montoya, Anthony F., Q-12
Moore, George R., CMB-AS
Moore, Homer G., CMB-11
Moore, James W., C-3
Morgan, Jerry A., M-6
Morrison, Louis J., P-9
Mulford, Ann D., WX-2
Murphy, David C., SD-1
Murphy, James T., L-1
Nash, Leona K., ISD-4
Neal, Timothy R., M-2
Newfield, Stephen E., CMB-6
Nielson, Clair W., L-6
Norris, Donald G., C-1
Novak, Thomas J., SD-4
Olivas, JoAnn P., C-2
Olivas, Manuel, SD-1
Orbersen, Stuart D., P-9
Ortiz, George R., SD-1
Padilla, Anthony J., SD-1
Padilla, Robert, SD-5
Parker, Jack L., Q-1
Parker, Ruth N., J-14
Patterson, William W., WX-7
Patton, Robert D., MP-9
Payne, Robert J., H-6
Perraglio, Robert, SD-5
Plumlee, Kay D., ENG-3
Powley, Gary C., M-4
Radziemski, Leon J., Jr., AP-4
Raol, Cheryl A., WPC-1
Ray, Shirley A., M-1
Reeves, Frank W., E-1
Rhorer, Richard L., SD-4
Rich, Sylvia S., WX-1
Rick, Frederick H., ISD-7
Ridlon, Rae N., P-14
Rivera, Tony A., ISD-5
Roberts, Donald G., J-7
Robinson, C. Paul, AP-DO
Roller, Theodore, MP-1
Romero, Raymundo A., SD-5
Rood, Patricia L., L-5
Ross, Frederick E., C-1
Ross, Sharon M., CTR-10
Roybal, Phillip L., P-14
Ruiz, Thomas J., C-1
Sandoval, Adelaido, C-1
Sandoval, Bertha T., WX-DO
Sandoval, Eugene, ISD-6
Scarberry, Richard D., CTR-5
Schamaun, Roger G., MP-8
Schillaci, Mario E., MP-3
Schultz, David E., C-1
Shapiro, Stanley L., AP-4
Shaw, Richard H., WX-4
Sickles, Wilbur W., M-2
Siemon, Richard E., CTR-3
Silbar, Richard R., T-5
Simenstad, Paul D., J-8
Smith, Jack E., SD-1
Smith, John D., CTR-8
Smith, Wayne L., MP-1
Snider, Patricia R., C-1
Spillman, George R., TD-DO
Stahl, Bruce J., ENG-1
Stovall, James E., MP-14
Talachy, Ernest A., WX-1
Thiebolt, Claudette G., CTR-DO
Tregellas, Richard T., MP-11
Trout, James C., PER-1
Troxel, Jimmie E., CMB-1
Trujillo, Jose F., CTR-8
Trujillo, Patricio E., H-5
Valdez, Helario, SD-1
Vance, Donald E., CMB-1
Van Dyke, W. Joseph, MP-8
Van Haaften, Frederick W., M-2
Veeser, Lynn R., P-3
Vigil, Herman, MP-1
Vigil, Seferino F., SD-1
Vogel, Herbert F., CTR-9
Voos, Matilda E., CMB-5
Walters, Ronald A., H-9
Weldon, David M., CTR-9
Wing, James D., MP-3
Winn, Felecia L., SEC. OFF.
Wolf, Michael A., E-1
Wood, Julia A., ISD-7
Woodard, Charles E., MP-11
Worth, Gary M., Q-2
Wright, George T., WX-3

15 Years

Ahearne, John T., SD-5
Allen, John D., WX-4
Allshouse, George O., TD-2
Archuleta, Floyd E., PUB-2
Atencio, Willie, H-1
Baca, James M., SD-5
Bacastow, Jack L., H-3
Baker, Donald D., WX-7
Barker, Helen L., CMB-8
Bartlit, Rohn R., Q-10
Beyer, Ann H., ISD-4
Bradberry, James R., CMB-6
Bradberry, Peggy L., DIR-FMO
Brashear, Robert W., PUB-2
Breen, George J., SD-5
Britt, Harold C., P-7
Brock, Ronald S., PUB-2
Brotherton, Kathryn S., WX-3
Burke, Clement J., M-2
Busse, Jack R., SD-2
Cameron, Donald F., WX-8
Campbell, Evelyn W., H-9
Capron, F. Ruth, CNC-4
Cashwell, Shirley J., T-DO
Chiles, Robert L., M-2
Cooper, Kenneth C., Q-13
Cordova, Flavio, CMB-6
Cowder, Leo R., Q-1
Davis, Evan Kenneth, SP-11
Deubel, Constantin, SD-1
Dings, Richard G., SD-5
Donahue, Wealthy M., WX-7
Eagan, Gerald D., AADP-1
Elliott, Raymond L., C-6
Everett, William R., P-4
Finch, Francis T., AP-DOT
Finley, Leo J., Jr., ENG-DO
Flaugh, Harry L., WX-3
Flick, Fred F., CMB-6
Fuller, Margarett V., DIR-ADLL
Gentry, Richard A., T-3
Gibbs, William R., T-5
Giger, Andrew J., Q-13
Gladfelter, Ralph J., Jr., WX-3
Greene, Joseph M., M-4
Grisham, Donald L., MP-7
Hantel, Lawrence W., WX-DO
Harbour Jack D., ENG-9
Harrison, Ronald, MP-8
Hayden, Robert J., C-DO
Henderson, Richard W., H-1
Henins, Ivars, CTR-5
Hickey, Bernard E., SD-5
Hicks, Betty L., AO-8
Hill, George G., WX-3
Hollinrake, Joseph M., J-8
Hults, Ruth I., PER-6
Isom, Bonnie L., H-5
Javorsky, Charles A., CMB-6
Johnson, James A., E-4
Johnson, Kaye A., CMB-11
Keller, Herbert L., WX-3

Klemmer, Kurt O., SD-5
Koonce, Billie R., WX-7
Kosty, Joseph, MP-10
Kunz, Walter E., Q-2
Kurtenbach, Joseph, SD-5
Langham, Terry D., CTR-8
Langhorst, Shirley, H-3
Lawton, Robert G., G-3
Lee, Jesse, ENG-4
Lemon, Glenn D., ENG-8
Liebenberg, Donald H., Q-10
Lindberg, Howard P., E-DO
Little, James D., MP-1
London, Jerry E., H-4
Loree, Thomas R., AP-2
Lujan, Fred F., WX-3
Lunsford, James S., P-11
McMillan, Dean E., P-9
Marriott, Bonnie L., SP-12
Martinez, Flavio, M-2
Martinez, Jimmy, WX-3
Martinez, Saturnino F., ISD-5
Meyer, James A., CTR-3
Mjolsness, Raymond C., T-3
Montoya, Juan J., M-2
Montoya, Teodosio, MP-13
Moulton, Charles E., J-6
Mowrer, Robert L., WX-7
Nix, James R., T-9
Overton, William C., Q-10
Owens, Herman C., E-5
Pacheco, John J., SP-2
Parkinson, Joseph L., WX-3
Pritchard, John A., H-5
Prueitt, Melvin L., TD-4
Pulliam, Edgar M., CMB-6
Richberger, Elmer C., SD-5
Riley, Jimmy L., CMB-7
Riley, Robert E., CMB-6
Rislove, Seth E., MP-2
Robinson, Thomas C., P-9
Romero, Joseph C., CMB-11
Roybal, Margaret R., WX-3
Salazar, Gilbert A., L-1
Salazar, Loyola S., SEC-OFF
Sanders, William M., H-6
Sapir, Joseph L., Q-DO
Sass, Harriett E., CTR-DO
Scargall, Carl E., WX-1
Seitz, Wendell L., WX-7
Sitzberger, Edward M., ENG-DO
Smith, Larry D., J-7
Speir, Leslie G., Q-1
Steedle, James R., SD-5
Stillman, Danny B., TD-7
Stone, Pauline L., P-4
Sutherland, Clair D., J-10
Thayer, Kasha V., ISD-6
Thorn, Lorraine E., CMB-1
Trimmer, Lenard E., M-1
Walther, Richard C., WPC-1
Welch, Carl L., MP-8
Wheat, Robert M., C-2
Whittemore, Gerald R., SD-5
Wilhelm, Doris J., ISD-7
Willenberg, Donald F., ENG-14
Winkler, Max A., M-1
Witte, Jay B., C-9
Young, Bonnie L., SP-12
Young, Carlton S., J-14
Zaenglein, Conrad G., ENG-2

20 Years

Abeyta, Belarmino L., CMB-6
Alarid, Fidel, SD-4
Alexander, Lon F., Jr., ENG-4
Armstrong, Dale D., P-14
Armstrong, Philip E., CMB-5
Baker, Don A., CTR-2
Barfield, Walter D., T-4
Barr, Donald W., CNC-11
Barthell, Barry L., CMB-6
Bergen, Delmar W., WPO
Borrego, Rumaldo A., SP-4
Bowersox, David F., CMB-11
Bronisz, Stanley E., CMB-5
Bryant, Ernest A., CNC-11
Bubernak, Joseph, CMB-1
Busick, John J., J-8
Cady, Howard H., WX-2
Calvert, George W., WX-3
Chamberlin, John J., C-1
Charlton, Charlie G., M-2
Clifford, Beverly J., WX-7
Clouser, William S., WX-1
Cowan, Robert E., E-2
Craig, Bobby G., M-DO
Cubitt, Richard L., WX-8
Daniels, William R., CNC-11
Davis, James R., SD-5
Delgado, Albert P., SD-5
Dudgeon, Willard B., J-7
Duran, Joe M., CMB-14
Ellington, Newby G., SP-DO
Ellis, Walton P., CMB-8
Esquibel, Librado E., H-7
Famularo, Kendall F., TD-9
Fenstermacher, Charles A., L-DO
Freed, Nancy L., TD-4
Giles, Paul M., WX-4
Giron, Guadalupe H., Jr. DIR-ADASF
Glascock, Robert B., M-4
Gonzales, Pablo E., SP-3
Hakkila, Eero A., Q-4
Hanna, Jess M., WX-3
Hannaford, Charles E., WX-2
Hardwick, Jack N., M-2
Hargrove, Mildred E., WX-7
Hill, Robert E., MP-2
Hiteman, LaVere A., WX-1
Horton, Everett H., Q-12
Hoyt, Martha J., C-3
Huber, Marilyn Joy, ENG-2
Hues, Alvin D., CMB-1
Humphrey, Richard W., J-14
Jahoda, Franz C., CTR-8
Johnson, Irving V., L-4
Kemme, Joseph E., Q-13
Kenyon, Merrill E., WX-1
Kramer, Frederick W., WX-3
Lamkin, Janet C., J-14
Land, Cletis C., CMB-5
Langley, Eleanor E., WX-4
Larkins, John H., H-10
Lawrence, Richard J., WX-3
Laymen, Edward R., PER-DO
Lazzaro, Eric S., M-4
Lewis, Richard E., C-DOR
Lier, Douglas W., J-14
Longmire, Calvin C., CNC-11
Lough, Ted E., ENG-4
Lowery, William T., SD-5
McCormick, Donald D., WPO
McFarland, Ralph, SD-5
Marr, Robert W., WX-3
Marshall, John, CTR-DO
Martin, Lorraine, PER-3
Martinez, Joe F., CMB-AP
Martinez, Mercedes, WX-3
Martinez, Pedro, WX-7
Milich, Charles P., E-5
Montoya, Joe B., ENG-3
Morris, Chester O., SD-5
Mottaz, Glenn H., CMB-11
Nelson, Gilbert B., CMB-1
Olsen, Harold F., Jr., ISD-3
Olsen, Kenneth H., G-2
Olwin, Richard B., J-6
Ortiz, Herman, Jr., ISD-5
Pacheco, Tony A., WX-1
Parker, Donald W., WX-4
Plageman, Margaret H., CNC-DO
Plassmann, Elizabeth H., WX-5
Quinn, Warren E., CTR-DO
Ramsay, John B., M-3
Riesenfeld, Werner B., CTR-6
Rink, John P., AP-2
Roehling, Duane J., AP-3
Rohr, Herman L., CMB-8
Roof, Raymond B., Jr., CMB-5
Rowley, John C., G-DOT
Roybal, Jose G., H-7

Ruhe, James R., SD-4
Salazar, Paul H., E-2
Sandoval, Robert L., H-1
Scott, Leonard T., L-10
Sharp, Robert R., Jr., G-5
Shepard, Marlan L., TD-2
Sherwood, Jerald L., MP-7
Shunk, Edward R., P-3
Simes, Doyle D., ENG-4
Simmonds, Dennis D., MP-1
Smith, Wendell E., SD-5
Sowder, Elmer J., Jr., J-6
Staritzky, Alice W., CNC-11
Stephens, Melvin M., Q-3
Stevens, Casimir F., J-10
Stevenson, James C., WPO
Tatro, Louis D., J-16
Taylor, John W., M-DO
Tegtmeier, Arthur C., ENG-4
Travis, James R., M-3
Vandervoort, Carrie S., Q-DO
Visscher, William M., T-11
Wakefield, Richard L., J-16
Warnes, Richard H., M-4
Weisgerber, Nina M., J-14
Welch, Richard E., P-9
Williams, Harry E., Jr., ENG-4
Wilson, Donald L., WX-7
Yasuda, Stanley K., H-5
Zinn, John, J-10

25 Years

Anstey, Marvin D., CMB-5
Apgar, Stewart A., CMB-11
Aranda, Henry, H-1
Archuleta, Ruben F., H-4
Basmann, William P., M-2
Baxman, Horace R., CMB-8
Baytos, John F., WX-3
Bell, George I., T-DO
Benziger, Theodore M., WX-2
Bottom, Esther Y., H-2
Bourne, Naomi R., CMB-DO
Byers, Neale O., ENG-12
Chavez, Johnny F., M-6
Childers, Edra L., WX-7
Christensen, Eldon L., CMB-11
Clayton, Dwight S., SP-2
Cole, Theodore R., CTR-4
Conner, Jerry P., P-4
Covington, Eston P., ENG-8
Cox, Arthur N., T-DOT
Cromer, Don T., CMB-5
Diaz, Precilla R., ISD-5
Driesner, Allen R., SD-2
Dropesky, Bruce J., CNC-11
Dube, Reginald R., M-4
Duhaime, Wilfred O., WX-3
Duran, Joe L., C-1
Emigh, C. Robert, P-14
Esquibel, Ramon C., CMB-11
Farrar, Ivy Frank, Jr., ENG-4
Felthauser, Harry E., P-4
Ferran, Gilbert H., H-5
Frank, Thurman G., L-5
Gallegos, Mike A., E-2
Gilbert, Bernie G., WX-7
Green, Lewis, F., WX-3
Greenwood, Arthur H., E-5
Griffin, Virgil W., ENG-8
Hoffman, Marvin M., J-DOT
Holm, Dale M., H-6
Jackson, Armanda L., WX-7
Johnson, James O., WX-8
Kephart, John F., Q-2
Lindholm, Glenn T., AP-1
Lucero, John D., AO-3
Lujan, Ismael E., E-1
Lyon, Buford O., J-1
Maestas, Joe E., PER-1
Martinez, Jose A., CMB-AS
Martinez, Jose U., H-1
Martinez, Juan C., WX-3
Martinez, Pedro E., ISD-4
Martinez, Vera G., ISD-4
Mascarenas, Joe A., CMB-11
Mayer, James E., J-16
Menzel, Mary T., P-11
Metropolis, Nicholas C., T-7
Montoya, Jose B., SP-3
Nims, Quay E., Jr., CMB-6
O'Rourke, John A., CMB-8
Osborn, Lewis C., Q-14
Pavone, Daniel, CMB-5
Pena, Robert M., ISD-7
Pimbley, George H., T-14
Price, Relf L., Jr., WX-3
Rich, Marvin, TD-9
Roach, Frederick J., ISD-5
Roach, William H., J-12
Rodriguez, Jose A., WX-3
Rogers, John D., CTR-DO
Rogers, Walter L., MP-1
Romero, Samuel, AO-5
Sanchez, Alfonso, WX-3
Schultz, John W., WX-3
Smith, Helen Louise, CNC-11
Smith, Ronald K., P-9
Spencer, William A., WX-3
Stein, Leland R., T-3
Steinhaus, David W., CMB-1
Stephens, Ward, WX-3
Stoddard, Stephen D., CMB-6
Stokes, Richard H., P-9
Stratton, William R., TD-7
Talafous, Carl F., SD-5
Thomson, David B., P-3
Thorpe, Munson M., NM
Tubb, Clarence E., SD-5
Voorhees, Edward A., C-DO
Wallick, Karl B., TD-9
Wilson, Kenneth J., PER-6
Woodwell, David A., E-1
Yarnell, John L., P-8

30 Years

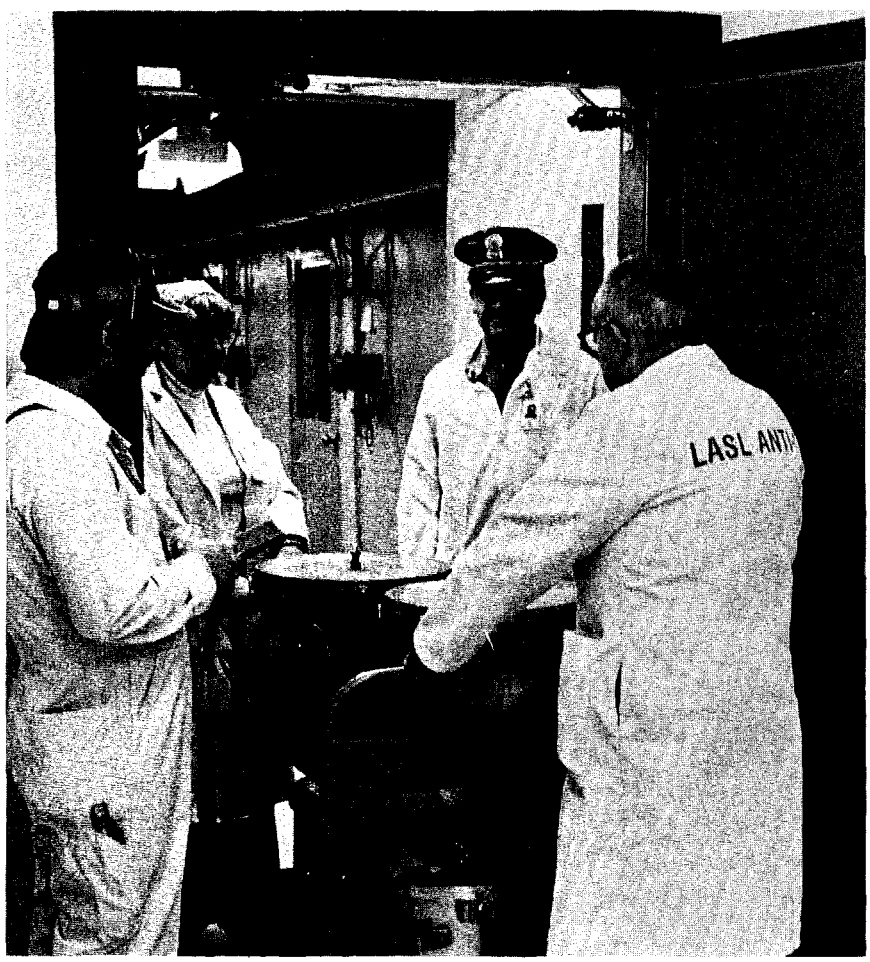
Aamodt, Rodney L., G-3
Abeyta, Henry J., CMB-6
Anderson, Ernest, H-DOT
Belcher, Philip F., DIR-SEC
Bemis, Edwin A., H-1
Blaut, Charles, SD-5
Bond, Curtis A., WX-3
Bruce, Wilma M., AO-2
Campbell, Robert H., J-DO
Carpenter, Robert L., CMB-1
Casados, Edward, WX-3
Cox, Earl J., H-1
Dallege, Ramona M., SP-12
Edmonds, James A., L-1
Evans, G. Foster, TD-9
Everett, Cornelius J., TD-6
Farr, John D., CMB-3
Fishbine, Harold L., J-10
Flores, Antonia H., Q-14
Fox, Alvin G., CMB-6
Freyman, Robert W., TD-7
Garcia, Gilbert G., H-1
Geoffrion, Robert D., H-1
Gibbs, Marian, CMB-5
Grilly, Edward R., Q-10
Grilly, Juliamarie, H-DOT
Haag, William E., M-1
Hall, W. Stanley, L-10
Harris, Troy C., WX-3
Hayter, Sidney W., CMB-11
Heinze, G. William, SP-4
Hill, James H., G-4
Johnson, Allan E., AO-6
Jurney, Edward T., P-DO
Langenbrunner, Eleanor, SP-2
Lanham, Lloyd E., CMB-QA
Lanter, Robert J., WX-1
Lawson, William H., WX-3

Lopez, Felipe M., SP-4
Lucero, Herman, SP-4
Lujan, Alfredo R., Q-11
Lujan, Annie S., WX-7
Maraman, William J., CMB-11
Marshall, Elisabeth, M-4
Martin, Robert H., ISD-7
Martinez, Lydia G., TD-DO
Martinez, Miguel A., SP-3
Meyers, Wilbert H., WX-7
Montoya, Frank A., SP-3
Montoya, Joe G., CNC-4
Neher, Leland K., J-14
Newbury, Flavil H., CMB-14
Newman, Max G., SD-1
Ortega, Arturo E., SD-1
Osborn, Robert L., H-1
Penneman, Robert A., CNC-4
Petranto, Joseph J., WX-1
Phillips, Donald D., J-12
Phillips, John R., Q-13
Powers, Marion E., L-4
Quintana, Frances G., ISD-7
Rexroth, Verner G., Jr., CMB-7
Riedel, Lee W., ISD-7
Rivera, R. Arthur, ISD-5
Romero, Jose B., H-1
Salazar, Henry C., Jr., SP-3
Sanchez, Jose S., SP-3
Sanchez, Lee F., WX-3
Schelberg, Arthur D., J-16
Schonfeld, Fred W., CMB-5
Simi, Oliver R., CMB-1
Southard, Frankie J., E-1
Sullivan, John H., CNC-2
Suydam, Bergen R., T-7
Tafoya, Antonio P., SP-3
Tapia, Joe A., ,WX-3
Tapia, Joe M., SP-3
Tucker, John L., WX-7
Urizar, Manuel J., WX-2
Vandervoort, Raymond C., CNC-4
Velasquez, Lucas R., WX-3
Vigil, Tranquilino, SP-4
Wechsler, Jacob L., WX-DO
Wellnitz, Beverly A., TD-DO
Winburn, Duane C., L-DO

35 Years

Putnam, Thomas M., MP-DO

First Shipment Of Plutonium To New Facility

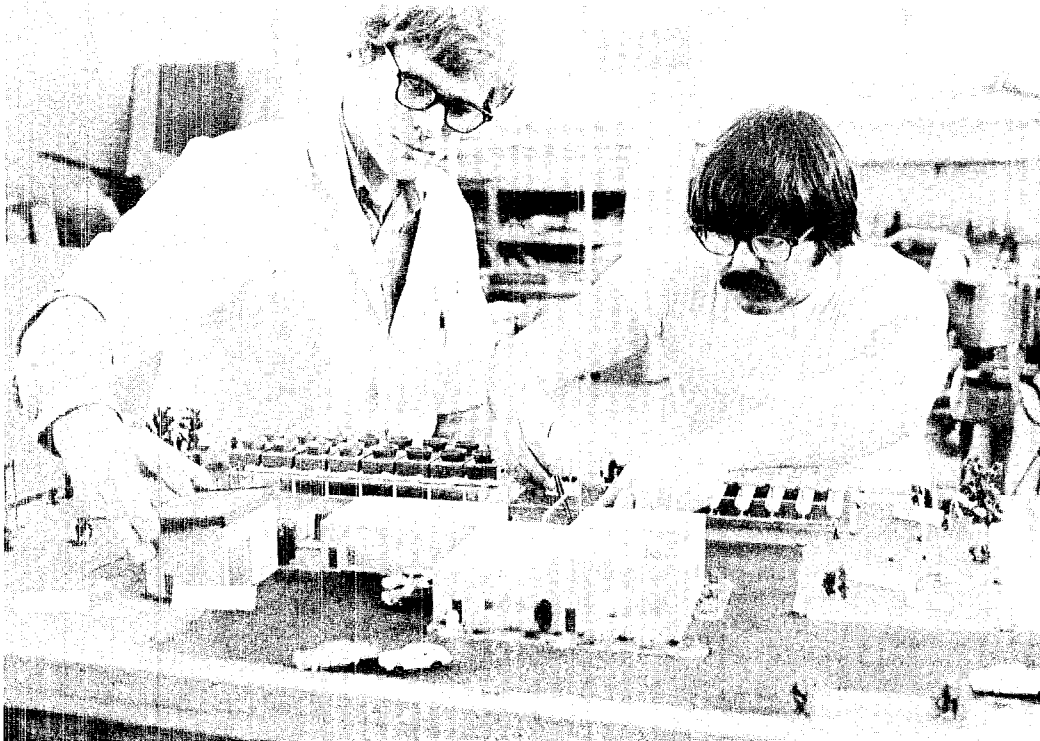


Plutonium in special containers is wheeled through a vault door on its way to secure storage at LASL's new plutonium handling facility. The plutonium, delivered in February, is the first shipment received at the facility.

Walt Disney Productions cameramen and technicians film steam at LASL's geothermal project in the Jemez Mountains. The crew members were at the project's Fenton Hill site for 2 days shooting movie film footage that may be used in a planned special presentation on energy.

Photo Shorts

Frank Fuchs, left, and Bruce Martinez, of the LASL Shop Department, constructed a model of a power plant for hot dry rock geothermal energy. The model shows flow patterns from the fracture beneath the plant. Designer of the model is Conrad Fink, G-4.



10 Years Ago

Compiled from the March, 1968 *Atom* and the *Los Alamos Monitor* by Robert Y. Porton

NINE STUDY LIGHTS

Nine Los Alamos scientists arrived in Christchurch, New Zealand, to launch a study of the Aurora Australis, or "Southern Lights." At the same time, another team will fly from Anchorage, Alaska, in a sister aircraft in flights which will be timed to permit their observations of the Aurora Borealis to be simultaneous with the observations by the New Zealand team. The auroral study is sponsored by the AEC with the assistance of NASA and the National Science Foundation.

COUNTY GOOFS

Numerous Los Alamos residents were up in arms after they received their electric utility bills from the County — with the amounts ranging from about 40 to 60 per cent higher than normal. Most of the units affected were multiple family units served by only one meter. The units were supposed to be charged the commercial rate rather than the lower single-family residential rate. The County failed to change the meters of the affected homes to the commercial rate. The County also failed to put any notice explaining the increase in with the bills. County Administrator Paul Noland said the incident was a "goof.".

RESTORATION

The old log cabin on Pajarito Road, less than 60 years old but probably the oldest building in Los Alamos County, has been restored to like-new condition by local Boy Scout Troop 229. The boys, plus several fathers, spent more than 1,500 man-hours restoring the back wall, rafters and ceiling beams and replacing the roof. Several logs for the back wall were cut, hauled to the site and peeled to match the existing logs.

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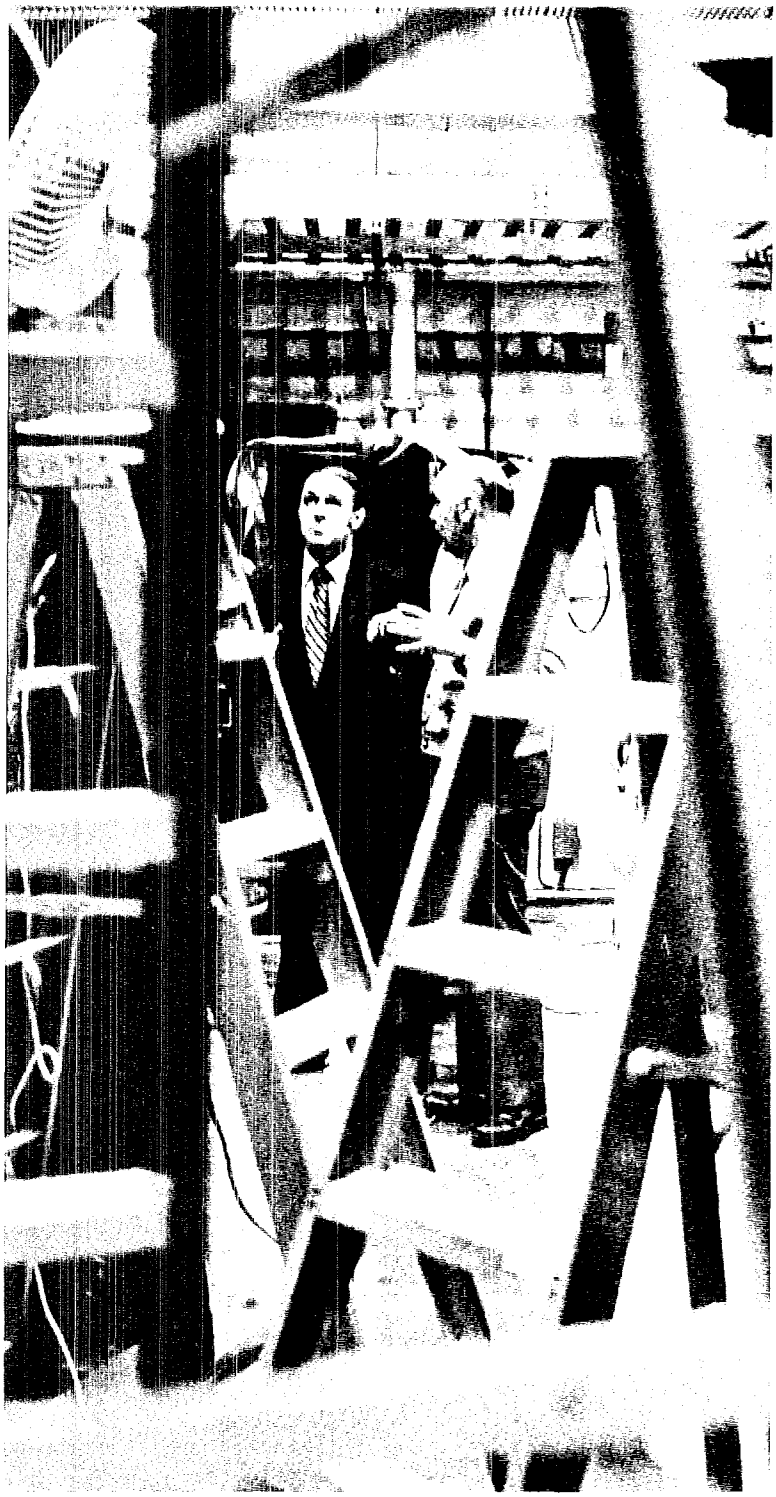
Among Our Guests



U.S. Representative C.D. Persell of Michigan is treated to a tour of L-Division's 8-beam CO_2 laser system by Sidney Singer, L-1 group leader.

LOS ALAMOS SCIENTIFIC LABORATORY